DYNAMIC ASSOCIATION OF EQUATIONS TO UNKNOWNS DURING SIMULATION OF SYSTEMS DESCRIBED BY HARDWARE DESCRIPTION LANGUAGES

ABSTRACT OF THE INVENTION

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In simulating a physical circuit or system including analog and mixed signal digital-analog components, a computer models the physical circuit or system as a system of simultaneous equations. Conditional equations with associated conditions that can be true or false at different analog solution iterations result in a system of simultaneous equations that

10 can change during the simulation. Rather than reformulating the system of simultaneous equations at each analog solution iteration, the system of simultaneous equations includes slots that are associated with conditional equations as the conditional equations become active. At a given point during the simulation, the conditions associated with the conditional equations are evaluated to determine which conditional equations are active. The values of

15 the active conditional equations are placed in the slots in the system of simultaneous equations. System variables are associated with active conditional equations. The system of simultaneous equations is then solved to determine the values of the system variables. If there are additional analog solution iterations, the active conditional equations can change, and different conditional equations can be associated with each of the slots in the system of

20 simultaneous equations. Once the simulation is complete, the results of the simulation (i.e., the values of the variables in the simulation model) can be used to analyze the behavior of the physical circuit or system.

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